

IN THE CLAIMS:

1. (Currently Amended) An acoustic sensor comprising:
  - at least one resonant element;
  - a driver comprising an electrical coupling means and an electromagnetic field source, arranged such that, in use, the electrical coupling means transfers current to the electromagnetic field source which produces an electromagnetic field that wirelessly drives the at least one resonant element, with matching resonances of the electromagnetic field source and the at least one resonance element, to produce acoustic waves directed to a predetermined part of a test sample, said electrical coupling means comprising a multiply resonant coaxial transmission line;
  - an electromagnetic detector arranged to receive, in use, the acoustic spectrum emitted from the test sample after the acoustic waves have interacted with the test sample; and
  - an electrical circuit connected to the driver and electromagnetic detector, the circuit arranged, in use, to provide the current and to detect, in combination with the electromagnetic detector, the acoustic spectrum received by the electromagnetic detector.
2. (Previously Presented) The sensor according to claim 1, wherein the electrical circuit comprises an electrical oscillator.

3. (Previously Presented) The sensor according to claim 1, wherein the electrical circuit comprises a frequency modulated signal generator, an AM diode detector and a lock-in amplifier.
4. (Previously Presented) The sensor according to claim 1, wherein the electromagnetic field source and the electromagnetic detector are the same member.
5. (Previously Presented) The sensor according to claim 1, wherein the electromagnetic field source is a single wire.
6. (Previously Presented) The sensor according to claim 4, wherein the electromagnetic field source is a coil.
7. (Previously Presented) The sensor according to claim 6, wherein the coil is spiral.
8. (Previously Presented) The sensor according to claim 7, wherein the coil is copper.
9. (Previously Presented) The sensor according to claim 8, wherein the coil is formed from wire wound into a flat spiral element.
10. (Previously Presented) The sensor according to claim 4, wherein the electromagnetic field source is a microwave horn.
11. (Previously Presented) The sensor according to claim, claim 10, wherein the electromagnetic detector is a single wire.

12. (Previously Presented) The sensor according to claim 10, wherein the electromagnetic detector is a coil.
13. (Previously Presented) The sensor according to claim 12, wherein the coil is spiral.
14. (Previously Presented) The sensor according to claim 13, wherein the coil is copper.
15. (Previously Presented) The sensor according to 14, wherein the coil is formed from wire wound into flat spiral element.
16. (Previously Presented) The sensor according to claim 10, wherein the electromagnetic detector is a microwave horn.
17. (Previously Presented) The sensor according to claim 16, wherein the resonant element is metal.
18. (Previously Presented) The sensor according to claim 17, wherein the resonant element is magnetostrictive.
19. (Previously Presented) The sensor according to claim 16, wherein the resonant element is piezoelectric.
20. (Previously Presented) The sensor according to claim 19, wherein the resonant element is a composite of at least two different materials.
21. (Previously Presented) The sensor according to claim 20, wherein the test sample is in a gaseous phase.

22. (Previously Presented) The sensor according to claim 21, wherein the resonant element is coated with a polymer layer.
23. (Previously Presented) The sensor according to claim 22, wherein the test sample is in a liquid phase.
24. (Cancel)
25. (Previously Presented) The sensor according to claim 24, wherein the resonant element is coated with a biorecognition layer.
26. (Previously Presented) The sensor according to claim 25, wherein in use, the sensor detects cells.
27. (Previously Presented) The sensor according to claim 25, wherein in use, the sensor detects proteins.
28. (Previously Presented) The sensor according to claim 25, wherein in use, the sensor detects antibodies.
29. (Previously Presented) The sensor according to claim 25, wherein in use, the sensor detects nucleic acids.
30. (Currently Amended) A method for use in acoustic sensing, the method comprising the steps of:

applying a current to an ~~electrical coupling means~~ a multiply resonant coaxial transmission line;

transferring current from the electrical coupling  
~~means~~ multiply resonant coaxial transmission line to an  
electromagnetic field source;

wirelessly driving, with an electromagnetic field produced by  
the electromagnetic field source, at least one resonant element to  
produce acoustic waves directed to a predetermined part of a test  
sample, resonances of the electromagnetic field being matched with  
resonance of said acoustic waves; and

detecting with an electrical circuit connected to the  
electromagnetic field source together with an electromagnetic  
detector and the electrical coupling means, ~~then~~ an acoustic spectrum  
produced after the acoustic waves have interacted with the test  
sample.

31. (Currently Amended) The method according to claim 30, wherein  
the at least one resonant element ~~produces~~ produces acoustic waves by  
electrostriction.
32. (Previously Presented) The method according to claim 30, wherein  
the at least one resonant element produces acoustic waves by  
magnetostriction.
33. (Previously Presented) The method according to claim 32, wherein  
the acoustic waves are detected by means of an electrical oscillator

tuned to the fundamental or harmonic frequency of the resonant element.

34. (Previously Presented) The method according to claim 32, wherein the acoustic waves are detected by means of a frequency modulated signal generator, an AM diode detector and a lock-in amplifier.